

Algebra 2 · Logarithms and Logarithmic Functions · Test

Common Core F-LE.A.4, F-BF.B.4a, F-IF.C.7e · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This 45-minute test has 9 questions worth 20 points. Calculators are allowed. Show your work for every question, and give exact values unless a question asks for a decimal.

Test information

- **Grade:** Algebra 2
- **Chapter:** Logarithms and Logarithmic Functions
- **Common Core:** F-LE.A.4, F-BF.B.4a, F-IF.C.7e
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 3 pts; Question 4: 2 pts; Question 5: 2 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 2 pts; Question 9: 2 pts)

Question 1: Convert forms (2 points)

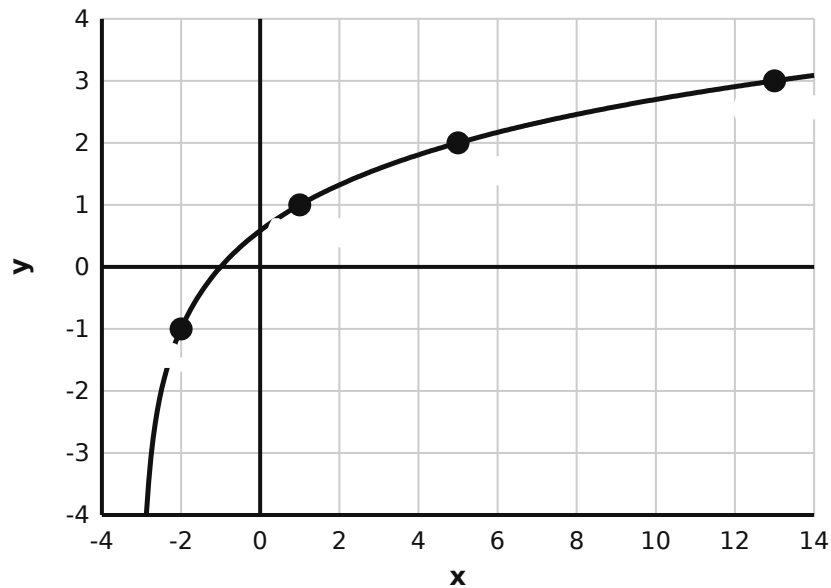
- Write $5^3 = 125$ in logarithmic form. (1 point)
- Write $\log_9 3 = \frac{1}{2}$ in exponential form. (1 point)

Question 2: Evaluate logs (2 points)

- Evaluate $\log_3 243$. (1 point)
- Evaluate $\log 0.0001$. (1 point)

Question 3: Graph of a logarithm (3 points)

The graph of $f(x) = \log_2(x+3) - 1$ is shown.



Graph of $f(x) = \log_2(x + 3) - 1$

- Write the equation of the vertical asymptote. (1 point)
- State the domain and the range. (1 point)
- Find the x-intercept algebraically. (1 point)

Question 4: Domain (2 points)

- Find the domain of $f(x) = \ln(4x - 12)$. (1 point)
- Find the domain of $g(x) = \log_5(7 - x)$. (1 point)

Question 5: Properties of logs (2 points)

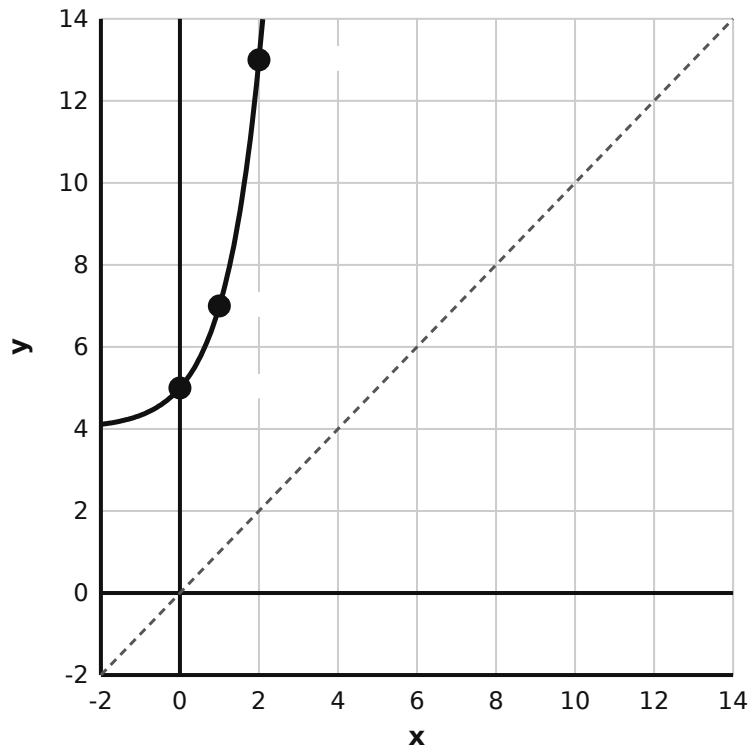
- Expand $\log_2 \frac{8x^2}{y}$. (1 point)
- Find the exact value of $2\log 5 + \log 4$. (1 point)

Question 6: Change of base (2 points)

Evaluate $\log_7 30$ to the nearest thousandth. Show the setup.

Question 7: Inverse function (3 points)

The function $f(x) = 3^x + 4$ is graphed.

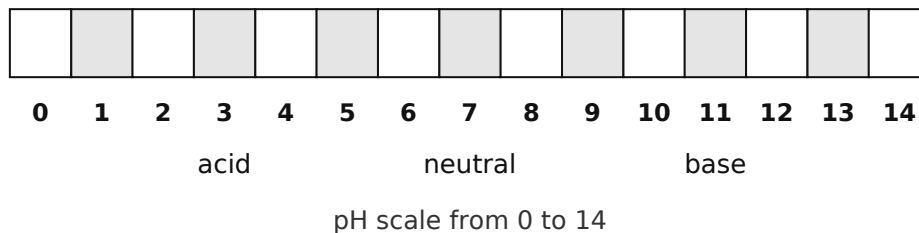


Graph of $f(x) = 3^x + 4$

- Find $f^{-1}(x)$. (2 points)
- Find $f^{-1}(31)$. (1 point)

Question 8: Acidity (2 points)

Use $\text{pH} = -\log[H^+]$.



- Lemon juice has $[H^+] = 0.0063$ mol/L. Find its pH to the nearest hundredth. (1 point)
- A solution has pH 8.4. Find $[H^+]$ in scientific notation with three significant digits. (1 point)

Question 9: Sound intensity (2 points)

Sound level is $L = 10 \log \frac{I}{I_0}$ decibels.

- a. Find $\frac{I}{I_0}$ when $L=70$. (1 point)
- b. Find L to the nearest tenth when $\frac{I}{I_0}=5\times 10^8$. (1 point)